

REMARKS

This Amendment is responsive to the Office Action dated April 21, 2004. Claims 11-20 were pending in the application. In the Office Action, claims 11-20 were rejected. In this Amendment, claim 11 has been amended, and new claims 21-23 have been added. Claims 11-23 thus remain for consideration.

Applicants submit that claims 11-23 are in condition for allowance and request withdrawal of the rejections in light of the following remarks.

In the Abstract

Applicants have provided a new abstract, and submit that the new abstract is in compliance with all formality requirements.

In the Title

The title has been changed to the title suggested by the Examiner. The new title is believed to be clearly indicative of the invention to which the claims are directed.

§103 Rejections

Claims 11-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Saenger et al. (U.S. Patent No. 5,633,781) in view of Barth et al. (U.S. Patent No. 6,451,644) as supported by the CRC Handbook of Chemistry and Physics.

Applicants submit that independent claim 11 is patentable over Saenger, Barth and the CRC Handbook.

Applicants' invention as recited in claim 11 is directed toward a process of manufacturing a semiconductor device. The claim recites "forming a first insulating film above a semiconductor substrate," and "removing a selected portion of the first insulating film, thereby

forming an opening.” The claim further recites “depositing a first electrode, a dielectric film and a second electrode successively on a bottom portion of the opening in substantially parallel relationship with a surface of the semiconductor substrate.”

Neither Saenger, Barth nor the CRC Handbook discloses depositing a first electrode, a dielectric film and a second electrode successively on a bottom portion of an opening in an insulating film formed above a semiconductor substrate, such that the deposits on the opening are in substantially parallel relationship with a surface of the semiconductor substrate. In particular, Applicants wish to comment on the Saenger reference.

Saenger’s capacitor layers 16, 18 and 20 are formed along side surfaces of the first insulating film (side surfaces of the opening 26) in order to electrically connect the capacitor layer 10 with the capacitor layer 16 (see Saenger Figs. 5G to 5I). Therefore, in Saenger, the capacitor layers 16, 18 and 20 are deposited almost perpendicular to the surface of the semiconductor substrate. Accordingly, Applicants believe that claim 11 is patentable over Saenger, Barth and the CRC Handbook – taken either alone or in combination – on at least this basis.

Claims 12-20 depend on claim 11. Since claim 11 is believed to be patentable over the cited references, claims 12-20 are believed to be patentable over the cited references based on their dependency on claim 11.

New Claims

New claims 21-23 depend on claim 11. Since claim 11 is believed to be patentable over the cited references, claims 21-23 are believed to be patentable over the cited references based at least on their dependency on claim 11.

In addition, Applicants note that claim 21 recites that a fourth insulating film being a low dielectric film is formed below the first insulating film, and that wire is formed in the fourth insulating film. In this manner, parasitic capacitance between wires is reduced. Saenger does not disclose the limitation of claim 21, and therefore can not realize the advantages of Applicants' claim 21 embodiment. Accordingly, the limitation imbues claim 21 with further patentable distinction.

Regarding claim 22, Applicants note that the claim recites that a connecting member and wire are formed in the third insulating film being a low dielectric film. Thereby, reducing the parasitic capacitance between wires. Saenger does not disclose the limitation of claim 22, and therefore can not realize the advantages of Applicants' claim 22 embodiment. Accordingly, the limitation imbues claim 22 with further patentable distinction.

In claim 23, the capacitor is formed apart from the first insulating film. By contrast, Saenger's capacitor layers 16, 18 and 20 are formed in contact with the side surfaces of the first insulating film (side surfaces of the opening 26) to electrically connect the capacitor layer 10 with the capacitor layer 16. Therefore, in Saenger, the capacitor is not formed apart from the first insulating film. Accordingly, the limitation of claim 23 imbues claim 23 with further patentable distinction.

Applicants respectfully submit that all of the claims now pending in the application are in condition for allowance, which action is earnestly solicited.

It is submitted that these claims, as originally presented, are patentably distinct over the prior art cited by the Examiner, and that these claims were in full compliance with the requirements of 35 U.S.C. §112. Changes to these claims, as presented herein, are not made for

the purpose of patentability within the meaning of 35 U.S.C. §§101, 102, 103 or 112. Rather, these changes are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

Statements appearing above with respect to the disclosures in the cited references represent the present opinions of the Applicants' undersigned attorney and, in the event that the Examiner disagrees with any such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the respective reference providing the basis for a contrary view.

If any issues remain, or if the Examiner has any further suggestions, he/she is invited to call the undersigned at the telephone number provided below.


The Examiner is hereby authorized to charge any insufficient fees or credit any overpayment associated with the above-identified application to Deposit Account No. 50-0320.

The Examiner's consideration of this matter is gratefully acknowledged.

Respectfully submitted,

FROMMER LAWRENCE & HAUG LLP
Attorneys for Applicants

By:



Grace L. Pan
Reg. No. 39,440
Bruno Polito
Reg. No. 38,580
Tel. (212) 588-0800